

REMARKS

This Amendment is submitted simultaneously with filing of the Request for Continuing Examiner.

With the present Amendment applicant has amended claim 12 and submitted additional independent claim 18.

It is respectfully submitted that the new features of the present invention as defined in claims 12 and 18 currently on file clearly and patentably distinguish the present invention from the prior art.

Turning now to the prior art, it should be emphasized that if the person skilled in the art turns to document FR 2 741 416 (FR), no indication is given on how to arrive at an easy-to-manufacture spur-toothed wheel as a single piece. In fact, this reference teaches away from the invention, because it claims the usage of two different materials: First material ("premier mat ériau", page 9, line 3) and second material ("deuxième matériau", page 9, lines 8-9). The usage of different materials can also be readily seen by the different shadings shown in Figures 2 and 3. The specification and also claim 8 further explain, that the material of the outer

disks is plastic ("él éments 31, 32 en mati ére plastique", page 5, lines 28-29) and that the inner disk is made of metal (roue dentée 4 en metal", page 5, line 35). Furthermore claim 1 of this reference states that the teeth of the inner disk are slightly set back ("sont légèrement en retrait", page 9, line 11). The intention to build such a wheel is as follows:

During normal operation the worm will be in contact with the outer plastic disks. If the force to be transmitted between the worm and the wheel suddenly increases significantly (e.g. due to a malfunction) the metal teeth of the worm will forcefully push against the plastic teeth (see, Figure 4 of the reference). To avoid that the plastic teeth break, the metal teeth of the worm now get into contact with the metal teeth of the inner disk thereby limiting the force acting upon the plastic teeth. Therefore, the reference requires different parts made of different materials and therefore cannot contribute to the solution of the task presented by the invention.

Turning now to the Japanese document JP 08-226497 the skilled person cannot derive the technical teaching in order to arrive at the invention. Looking at the abstract and the presented figure the invention relies on two identical helical gears (for the required symmetry) and a collar of a proper thickness (in order to adjust the distance between the helical

gears). The key to the invention presented in the Japanese reference lies exactly in the fact, that the wheel is made up of several parts, wherein each individual part can be produced highly accurately and easily with general tools. Therefore, the skilled person looking for an easy-to-manufacture yet precise wheel, would derive the teaching to use multiple parts on purpose instead of a difficult to manufacture single piece wheel. But even if, for some far-fetched reason, the skilled person were to consider the wheel as a single piece, it would be obvious that due to the complex shape general tools could not be applied. Rather either a milling machine or an injection moulding form would be required. The milling machine is expensive and it takes significant production time. The moulding form would have to be a multi-part form (due to the steeply tilted cone surfaces and the significant valley between these surfaces), producing edges at the intersections, which leads to a significantly reduced accuracy of the wheel. In summary, the skilled person knows that in order to achieve the benefits of the suggested invention (high accuracy and easy manufacturing with general tools) it requires the wheel to be made up of several individual parts. The Examiner's attention is directed also to the fact that this reference does not teach the smooth and continuous transition between the first and second wheel disks, so that it is questionable whether the skilled person would actually consider this document when designing a wheel which requires this feature.

In summary a look at the French reference and the Japanese reference, either alone or combined, will not lead the skilled person to the solution of the task the invention has set out to solve, namely providing a spur-toothed wheel as a single piece, which is markedly simpler and less expensive to produce (by injection moulding), while still maintaining a high accuracy of the manufactured wheel.

Turning now to Figure 3 of the invention, which corresponds to part 2 of claims 12 and 18, it is clear that more power can be transmitted compared to the easy-to-manufacture prior art wheel shown in Figure 1, right hand side, because the effective surface for the power transmission is twice as big. Yet, the wheel shown in Figure 3, can easily be manufactured as a single piece form (see page 3, lines 15-18). The use of a single piece form ensures a high precision and the produced wheel can be easily removed from the form using a helical motion. A wheel like presented in Figure 3 is not obvious and cannot be derived from the prior art.

The Invention further suggests a wheel with two virtual disks, both in the shape of a truncated cone (contained in claim 12), and a type of wheel with three disks where an exemplary embodiment is shown in Figure 2 (claim 3). Even these wheels can be produced as a single piece in a single

piece form by injection moulding. The process to do this is known to the skilled person by "Zwangsentformung", which describes a forced removal of the product based on plastic from its form. The process of the forced removal is known to the skilled person as follows:

To produce the product the hot liquid plastic material is injected into the form. At a point in the cooling-off process, specifically at a point, when the product has become elastic (meaning it can still be stretched and bent, but will revert to its original shape), the product is forcefully pushed/pulled out of the form. For a short time this will deform the product, but the product will return to its previous shape immediately as soon as it has left the form. This process is applied when the skilled person manufactures objects with e.g. recesses, where the objects cannot be removed from a single-part form due to their shape if let in the form to completely cool down, thereby raising the need for an undesired multi-part form. The forced removal can be successfully applied to the invented wheel, because the difference between the innermost and the outermost point is kept small, which can be seen from the figures as detailed above. The person skilled in the art knows or will find out by simple experiments for which dimensions of the wheel and the teeth a forced removal is possible without comprising the high accuracy. The claimed "smooth transition" defined now in claim 12

helps to ease the forced removal. The combination of the advantageous features of the invention could not have been derived by the skilled person from the prior art documents.

It is believed that the Examiner's assessment of the invention being obvious over the prior art, is significantly based on a hindsight view. Taking a look at the prior art documents on why a skilled person would consult them and on what the skilled person would realistically derive, it seems far-fetched that the skilled person could arrive at the invention. It seems like the Examiner tries to force single items from the prior art together considering the teaching of the invention. He makes assumptions on how the skilled person could arrive at the invention, even though there is no motivation for the skilled person to do so, if looking forward from the prior art (and not looking back from the invention).

Applicant's respectfully disagree that the claim of a "single piece" can only be understood as a product-by-process claim, because the prior art products differ significantly from the inventive product. Even if it would be considered a product-by-process claim, the skilled person can tell whether the product was produced by injection moulding or by some other means, e.g. by milling or by glueing separate parts together, so that a "single

piece, injection moulded, plastic wheel with smooth teeth transitions" can certainly be differentiated from other products.

On page 2, section 3, the Examiner references the French patent and repeatedly uses the word "generally". It is not understood why the Examiner chose to introduce the broadening word "generally", because it was removed from claims. There is a significant different whether the disk is e.g. "Generally cylindrical" or "cylindrical".

Furthermore, the Examiner states that the French patent with three disks is similar to the wheel of the independent claim. Applicants respectfully disagree with this, as the independent claims mention two disks and suggest three disks in a dependent claim only.

The Examiner rejected the original claims as being anticipated by the French patent publication. In connection with this, the Examiner's attention is respectfully directed to the decision Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984) in which it is stated:

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim."

Definitely, the reference does not disclose each and every element of the claimed invention arranged as in the claims.

The claims were also rejected as being obvious over the French patent publication in view of the Japanese patent publication.

None of these references teaches the new features of the present invention as defined in the claims. In order to arrive at the applicant's invention from the references, the references have to be fundamentally modified by including into them the new features which were first proposed by the applicants. However, it is known that in order to arrive at a claimed invention, by modifying the references the cited art must itself contain a suggestion for such a modification.

This principle has also been consistently upheld by the U.S. Court of Customs and Patent Appeals which, for example, held in its decision in *re Randol and Redford* (165 USPQ 586) that

Prior patents are references only for what they clearly disclose or suggestion; it is not a proper use of a patent as a reference

to modify its structure to one which prior art references do not suggest.

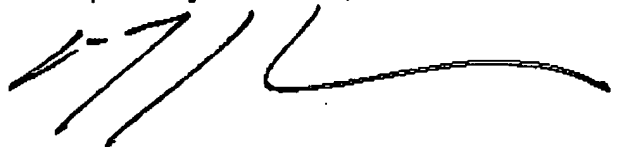
Definitely, the references do not contain any hint or suggestion for such modifications.

In view of the above presented remarks and amendments, it is believed that the claims currently on file should be considered as patentably distinguishing over the art and should be allowed.

Reconsideration and allowance of the present application is most respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawings be further amended or corrected in formal respects in order to place this case in condition for final allowance, then it is respectfully requested that such amendments or corrections be carried out by Examiner's Amendment, and the case be passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, he is invited to telephone the undersigned (at 631-549-4700).

Respectfully submitted,

A handwritten signature in black ink, consisting of a stylized 'S' followed by a long horizontal stroke.

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